Combining Integrated Safety and Health Strategy With Enhanced Work Planning: And Implementation Approach for PUREX Facility

INTRODUCTION

Currently there are two closely related activities sponsored by the EH Office of Worker Health and Safety (EH-5) to help enhance safety and health during actual field work at the DOE sites. The first effort, conducted under the EH-5 D&D Technical Assistance Project, is the development and implementation of an Integrated Safety and Health Strategy (ISHS) for surplus facility deactivation and decommissioning (D&D). Since 1993, EH-5 has assisted in the development and implementation of the ISHS at the PUREX deactivation project at Hanford. The ISHS and lessons learned from PUREX is documented in DOE/EH-0486, to be published in December 1995.

The second effort is the Enhanced Work Planning (EWP) demonstration initiated in 1995 at the Hanford Tank Farm. This process and the results are documented in the Hanford Site Demonstration Project Draft Report (August 31, 1995) and the Interim Report on the Fernald Enhanced Work Planning Demonstration (November 1, 1995). The EWP demonstration is designed to increase safety and health integration through up-front multi-disciplinary team approach to work. This process was also intended to improve the efficiency of the current work development/control process.

The purpose of this document is to detail a process for the integration of these two strategies. The process outlined here is based on the current approach being developed and implemented at the PUREX deactivation project. Key to the development and implementation at PUREX is the current re-engineering effort. Re-engineering of the project organization is based on the formation of self directed multi-disciplinary teams. As a result, the process discussed below will be based on this same organizational structure.

INTEGRATED SAFETY MANAGEMENT PROGRAM

The combination of the ISHS and the EWP processes results in an Integrated Safety Management Program (ISMP). This program, as illustrated in figure 1, encompasses both the project level and work task level aspects of the deactivation project. While the ultimate products of these two levels differ greatly, the objectives are the same.

The primary objectives in the ISMP are:

- To integrate involvment of workers and the appropriate safety professionals at all levels and steps in the project and work task planning process;
- Improved quality and cost effectiveness of both hazard evaluations related to worker safety

hazards and the safety basis through the use of a graded hazards identification, screening and assessment process;

- Increased efficiency in the work planning and execution process, through minimization of potential rewrites and stop work orders both due to hazards and/or inexecutable procedures;

- Improved communications throughout the facility organizations responsible for the deactivation project.

These objectives are achieved through the use of multi-disciplinary teams at all levels of the deactivation project. These teams and the graded hazards assessment process constitute the key elements of this process.

Project Level

As illustrated in figure 1, the ISMP consists of activities conducted on a global project planning level as well as activities specific to planned work tasks. Below is a discussion of each of these activities.

Establish Multi-disciplinary Teams

From the project initiation, the development of multi-disciplinary teams is considered one of the key elements of the ISMP process. In facilities or projects that do not have an organizational structure that is based on multi-disciplinary teams, the formation of such a team for the initial project development and hazards assessment processes is essential. The use of a multi-disciplinary team to perform necessary planning, analysis, and control activities can result in a safer and more efficient effort. Typically, a multi-disciplinary team will consist of representatives from engineering, planning, safety and health, project management, and the workforce. Early in the planning process, it is necessary to identify the disciplines that should participate on the team and the teams roles and responsibilities. The group should be empowered to make decisions throughout the project.

Preliminary Project Planning

Preliminary project planning involves translating project objectives into proposed major deactivation tasks. At this stage, project mangers with support from the project team(s) can also estimate ancillary project support activities that are needed, required resources and project schedules. Safety and health expertise and worker input via the project team(s) is critical during preliminary planning for identifying potential adverse impacts to project schedule, cost, or personnel due to safety and health related issues or barriers.

Preliminary Hazards Analysis

In the ISMP process, there are two distinct aspects to this activity. The first is the preliminary hazards analysis of the project as a whole. This activity is used to define or modify (i.e. from previous analyses during operations) the authorization basis and provides a baseline of the hazards associated with the entire project. This is the first step to identifying, evaluating, controlling and communicating hazards likely to be encountered in the deactivation project. Information provided by this effort will be used to help refine previous facility hazards categorizations, determine safety analysis

documentation needs, the content of health and safety plans, and the applicable standards and requirements (SRIDs) that will govern the deactivation project. The preliminary project hazards analysis will also serve as the foundation for subsequent task-based hazards analyses. This analysis should include collection and review of facility historical information, a physical survey of the facility and a formal evaluation of results/analysis as appropriate using the graded approach.

The second aspect to this activity is the preliminary or "umbrella" hazards screening of the major deactivation activities identified above. The objective in performing this preliminary screening is to identify the major tasks with potential impacts to the authorization basis, schedule or that present significant hazards. This hazards screening will be completed using the PHSA form currently used at PUREX. The assessment will be made based on the general and limited information available at this early stage. While this screening will not serve for a detailed hazards assessment it will help identify those activities likely to require additional assessment, engineered controls or explicit DOE approval prior to execution.

Engineering Technology Selection

Using the preliminary hazards analysis information, the use of different engineering approaches to the proposed activities or engineered controls can be successfully evaluated. Performing these evaluations at this stage of the project ensures that schedule Dependent upon factors such as the relative hazard of the project, the duration of the project, the adequacy and the age of the safety documentation some documents may need to be revised or replaced. However, impacts are minimized and that workers, the environment and the public are adequately protected in the completion of deactivation activities. Use of this approach will minimize the reliance on PPE as a means of addressing hazards when there are reasonable and cost effective engineering alternatives.

Applicable Safety & Health Standards

Based on the hazards, types of materials and processes to be used, the applicable standards can be identified. The process for identifying these requirements is consistent with DNFSB 90-2 and 95-2 recommendations. The applicable requirements that are necessary and sufficient to ensure the safety of the project are identified in the Standards/Requirements Implementation document. Per the DNFSB recommendations, these requirements should become part of the contractual and authorization basis commitments. However, in the case of a deactivation or similar project of relatively short duration, the revision of existing procedures to include all the requirements of the S/RIDs may not be warranted. In these cases, the incorporation of these requirements in the deactivation activity work development processes may be sufficient to ensure the safety of the project activities. The work task level process discussed below is designed to incorporate the S/RIDs in the work development to achieve a graded implementation of the S/RIDs for the project.

Key Project Safety & Health Documents

there is a great potential for cost savings if the existing documentation can be used. The development and approval process for new safety documentation can be both a long and expensive process. Specifically, the

development and approval of a new Safety Analysis Report (SAR) for the deactivation project based on DOE 5480.23 and the associated Technical Safety Requirement(s) (TSR) based on DOE 5480.22 would be a costly process, especiaaly for a higher hazard facility.

Using the information obtained in the items above, the adequacy of the existing documentation and should be evaluated by the team(s) with involvement of DOE and other stakeholders in the final determination process. If updates are required, again the information from the previous sections will provide an excellent basis for the updates. To the maximum extent possible any upgrades should be consistent with DOE-STD-3011-94, *Guidance For Preparation of DOE 5480.22 (TSR) amd DOE 5480,23 (SAR) Implementation Plans* . The development of a Basis for Interim Operations (BIO) for the these types of projects will minimize the cost and time required for safety documentation upgrades. This will ensure the quality of product necessary and minimal additional time for information gathering and document development.

Work Task Level

Identify Work Task

As in any work task development process, the process begins with the initial work identification. In a team based working environment, much of the work task identification will likely be performed by the teams. As was discussed above, through the project level activities, it is expected that major deactivation tasks will be identified early in the project development. However, at this level all tasks will be developed following this same process. By using the multi-disciplinary team(s), the workers as part of these teams, will be involved in this initial phase.

Deactivation Work

At this point, all tasks not previously identified as deactivation work are evaluated to determine if it is a deactivation activity. The intent of this determination is to ensure that all deactivation tasks receive the appropriate level of hazards screening and evaluations. The driver for this concern is the greater potential for impact to the authorization basis represented in the deactivation activities.

As figure 1 illustrates, if the work is identified as deactivation work, a PHSA screening will be completed. The objective of completion this screening early in this process is to determine any additional level of hazards analysis that may be required, related schedule impacts and authorization basis impacts.

Assign Work to Team

In the process being developed, there are several multi-disciplinary teams with distinct areas of responsibility within the facility/project. These teams include, ancilory buildings, canyon, HVAC and others. At this point, the work will be assigned to the appropriate team. The team will be responsible from this point on for the work development, hazards/controls identification, safety professional involvements and the ultimate safe completion of the work.

Perform Hazards Checklist

At this point the work team will be responsible for the completion of a hazards checklist. The hazards checklist along with the use of multi-disciplinary teams is key to the graded hazards assessment process in the ISMP. This checklist (called a JHA in the EWP) is used by the team to make several determinations regarding the work task. Key areas that are addressed by the checklist are:

- Level of detail for the work document (i.e. verbal, skill of craft or written instructions);
- Level of additional hazards analysis required;
- Necessary permits and blank copies of these permits for the team to complete;
- The necessary level and types of safety/support personnel to be involved in the process (such as industrial safety/hygiene, nuclear safety, fire protection, environmental and QA).

The hazards checklist is being developed on a computer database to increase usability and the access of the team to supporting information as needed.

In completing the checklist, the team will identify the hazards associated with the activity, the relative complexity, hazard and facility experience with the task, and potential impacts of the activity. The resulting output will include the list of hazards identified, the level and types of safety professionals to be involved in the process, the level (if any) of additional analysis required and whether or not written instructions are required for the task.

This process will provide a systematic, documented and consistent means for the teams to determine and complete the necessary elements related to the work development and authorization process using a graded approach consistent with both the activity and facility levels of hazards.

All of the remaining activities identified in figure 1 are based upon the completed checklist.

Written Instructions

If the relative hazards and the complexity of the task are both very low, the work activity can be authorized by the team without additional written work instructions. Examples of tasks that fit into this category are items such as "troubleshoot and repair" of non-Operational Safety Requirement (OSR)/safety class 2 equipment, and sampling of non-hazardous materials.

Items not identified as requiring written instructions (skill of craft or verbal authorization activities) can be authorized and completed by the work team without additional requirements. The checklist has a number of criteria that are used to determine the level of activities that can be authorized in this manner. They must be low hazard, covered by existing radiation work permits and be simple tasks with which the facility personnel are experienced and have had no accident experience. All other tasks not meeting these stringent criteria will require the development of written work instructions.

Determine Level of Safety Involvement

As noted above, the checklist will identify the recommended level of safety involvement in the review and authorization of the work

activity. There are essentially three levels of possible safety involvement. The first level requires no safety involvement. In this case the hazards do not warrant the involvement of these professionals. The requirement for written work instruction was likely based on the complexity or duration of the task and not hazards.

The second level of safety professional involvement is the review, input and/or approval of the work document. In this case, the team will work with the identified professionals in developing the work instructions to minimize the hazards and ensure the appropriate permits and controls are identified and in place. In some cases formal approval of the work instructions by safety personnel will be required.

In the third level, the checklist has identified the need for additional formal analysis of the work. In this case, the written instructions will be drafted with safety input as appropriate. This draft instruction will then be used by the analyst to determine the appropriate level and type of analysis to be completed. This determination will be documented using the PHSA screening form. The draft instruction will then be used to complete the appropriate analysis.

Develop Written Instruction

Having determined that written instructions are required for the safe completion of the proposed activity, the team will develop the work instruction. Here the use of the multi-disciplinary teams will help ensure that considerations from all areas are addressed. The existing work development requirements for work plans will be used in the development of these activities. These include the requirements from DOE 5480.19, *Conduct of Operations* and other applicable standards.

The inclusion of applicable standards and requirements from the facility S/RIDs and the applicable contractor manuals will provide the team valuable information. The inclusion of these requirements in the developed work documents will provide a graded application of the S/RIDs for all new work developed. This will provide a graded implementation of the DNFSB recommendations (90-2 and 95-2) related to the S/RIDs.

With the involvement of the safety professionals in either of the higher levels, the work development process and the safety review/analysis process will likely be iterative. This will ensure that the controls identified either by the safety personnel/team or through the hazards analysis process are incorporated and adequate.

Other Requirements

Regardless of the safety involvement path required by the checklist, there are additional items that may need to be addressed. These will also be identified by the completed checklist. Included in these are:

- USQ determinations consistent with the requirements of DOE 5480.21 and the facility specific procedure,
- The need for a hazards classification or consequence analysis for possible ORR implications, and
- Final permits and/or approvals required.

These final areas are important to all aspects

of safety from the worker safety considerations to authorization basis impacts. They are required to be completed at this stage since they rely upon the final work instructions to be completed accurately.

Work Release

Having completed and documented the items above, the work is ready to be released/authorized and completed. Key in this process is the fact that the team developing the work is also responsible for completion of the work. This will improve the hazards recognition of the work teams and the communication of these hazards. While pre-job safety meetings may still be required for a number work tasks, this process will ensure that this is not the first time that the workers have seen the work instruction or been made aware of the hazards.

Following completion of the work activity a post review may be warranted based on the conditions identified during the activity. If such a review is completed the lessons will be shared with other work teams. A likely means of providing this information would be the completion of a revised checklist to identify the unanticipated conditions or hazards encountered.

CONCLUSION

The ISMP detailed above is based on the two projects that were separately undertaken by EH-5 personnel to assist in deactivation projects and work development. This process takes advantage of the similarities in the two approaches to develop a smooth integrated process. However, it is the differences between the two approaches that lead to the expected benefits of the integrated process.

The process as outlined above is currently in the final developmental stages at the PUREX deactivation project and will be implemented in January of 1996. At that time, the restructuring of the organization into self-directed multi-disciplinary teams will be complete. It is likely that some of the discussion above will be changed in the final stages of the development process, however, these changes would be expected to be minor adjustments and not directional changes.

The checklist is currently in the final stages of computer development and some field testing. This process is expected to be completed in the next month. When a final checklist is completed it will be provided as an attachment to this document.

The commitment of WHC, PUREX and the EH-5 teams in refining and implementing this process will lead to a high expectation of success.